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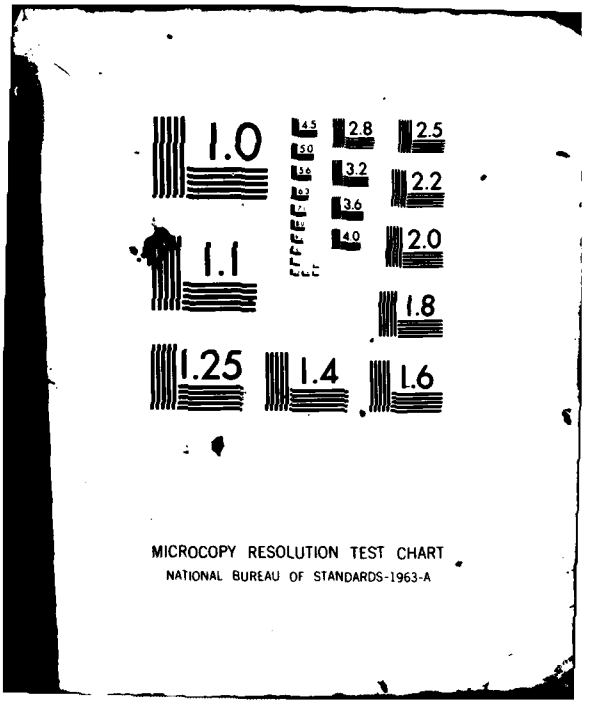
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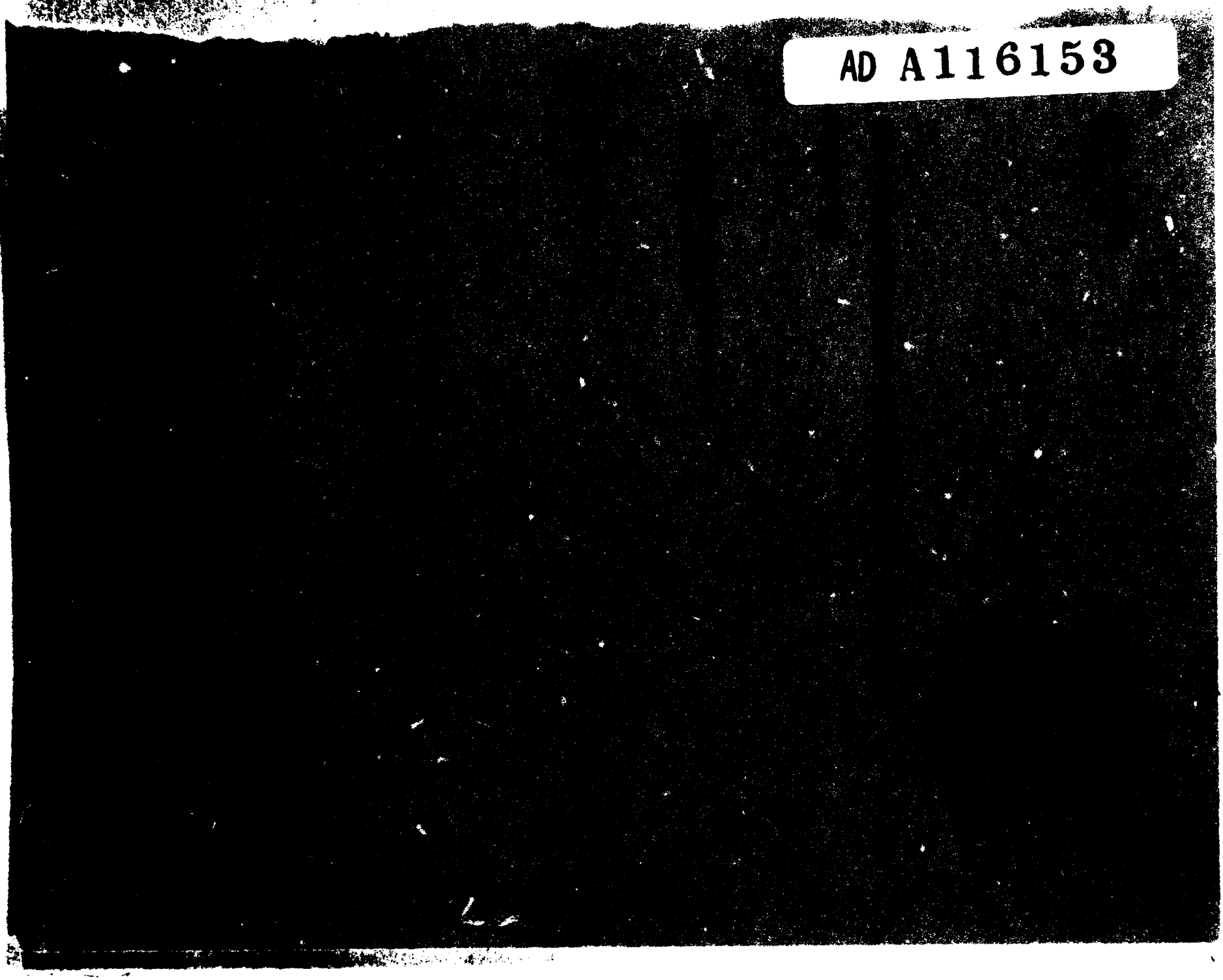

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number):
The MB-3 Tester is an electric motor-driven cabin leakage tester designed to furnish pressurized air to the aircraft at controlled pressures and temperatures during ground pressurization of aircraft cockpits and pressurized compartments. This report provides measured data defining the bioacoustic environments produced by this unit operating at a normal rated/load conditon. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived

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noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Refer to Volume 1 of this handbook, "USAF Bioenvironmental Noise Data Handbook, Vol. 1: Organization, Content and Application," AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc.

PREFACE

This report was prepared by the Biodynamic Environment Branch, Air Force Aerospace Medical Research Laboratory, under Project/Task 723107, Measurement and Prediction of Noise Environments of Air Force Operations.

The author gratefully acknowledges Mr. John N. Cole for his assistance in preparing this report, Mr. Robert G. Powell for his assistance in acquiring the raw data, Mr. Henry T. Mohlman and Mr. Fred D. Lampley of the University of Dayton for their assistance in the mechanics of data processing, and Mrs. Norma J. Peachey who typed and prepared the graphics.

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INTRODUCTION

The MB-3 tester is an electric motor-driven cabin leakage tester designed to furnish pressurized air to the aircraft at controlled pressures and temperatures during ground pressurization of aircraft cockpits and pressurized compartments.

This volume provides measured data defining the bioacoustic environments produced by this unit. Such data are essential to evaluate ear protection requirements, limiting personnel exposure times, voice communication capabilities, and annoyance problems associated with operations of the MB-3.

This volume is one of a series published by the Air Force Aerospace Medical Research Laboratory (AFAMRL) under the same report number (AMRL-TR-75-50) as a multi-volume handbook that quantifies the noise environments produced at flight/ground crew locations and in surrounding communities by operations of Air Force aircraft and ground support equipment. The far-field, community-type, noise data in the handbook describe the noise produced during ground operations of aircraft, ground support equipment, and other ground-based equipment or facilities.

Volume 1 of this handbook discusses the objectives and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. Refer to Volume 1 (reference 1) for such information because it is not repeated in other handbook volumes.

A cumulative index lists those aerospace systems contained in the handbook, and identifies the specific volumes containing each type of environmental noise data available (i.e., inflight/flight crew and passenger noise, near-field/ground crew noise, far-field/community noise). Volume numbers are assigned sequentially as individual volumes are published. This index is periodically updated as individual volumes are published, and is available upon request from AFAMRL/BBE, Wright-Patterson AFB, OH 45433. Organizations on the distribution list for the handbook will automatically receive a copy of the updated index as it is generated.

Direct any questions concerning the technical data in this report and other handbook volumes to: AFAMRL/BBE, Wright-Patterson AFB, OH 45433; Autovon 78-53675 or 78-53664; Commercial (513) 255-3675 or (513) 255-3664.

1. Cole, John N., *USAF Bioenvironmental Noise Data Handbook, Volume 1: Organization, Content and Application,* AMRL-TR-75-50 (1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.

NEAR-FIELD NOISE

MEASUREMENTS

A standard MB-3 tester was operated outside, in front of radar docks used for aircraft maintenance, on a concrete slab, at a normal rated condition (3 psi). Due to the proximity of the radar docks no far-field data were acquired.

Figure 1 identifies 36 noise measurement locations at a height of 1.5 meters above the concrete apron (nominal ear level of ground crew). The 0 degree reference direction passes through the tow bar. These locations are in the acoustic near-field of the source where the sound wave fronts generally do not spherically diverge and the source appears to be spatially distributed (i.e., not a point source). Consequently, these near-field data cannot be extrapolated to longer distances but do properly define the levels at locations close to the unit.

Near-field measurements were also made at ear level at the operator control panel. Table 1 lists the numeric/alphabetic designators used on the data pages in this report to identify the operator measurement location and test conditions. The designator 1/A means operator location 1 and test condition A. Such a descriptor is essential in many handbook volumes that involve multiple combinations of locations/conditions. It is used in this report to maintain format consistency.

RESULTS

The measured data presented in Table 2 define the sound pressure levels (SPL) produced by the MB-3 unit at the 37 specified, near-field locations. This table includes the overall, 1/3 octave band, and octave band levels. From these data one can calculate the variety of measures in Table 3 which are widely used to assess the effects of noise on personnel and their performance.

For data at other intermediate near-field locations (i.e., for radial distances less than 4 meters) you can interpolate between the 36 measured data points.

TABLE 1

MEASUREMENT LOCATION AND TEST CONDITION
FOR OPERATOR NOISE MEASUREMENTS

MB-3 Tester, Pressurized Cabin Leakage, Aircraft
Tyndall AFB, 19 June 1980
FSN 4920-288-1566, Field # J-112

Measurement Location	
1	Operator Control Panel
Operation	
A	(3 PSI)

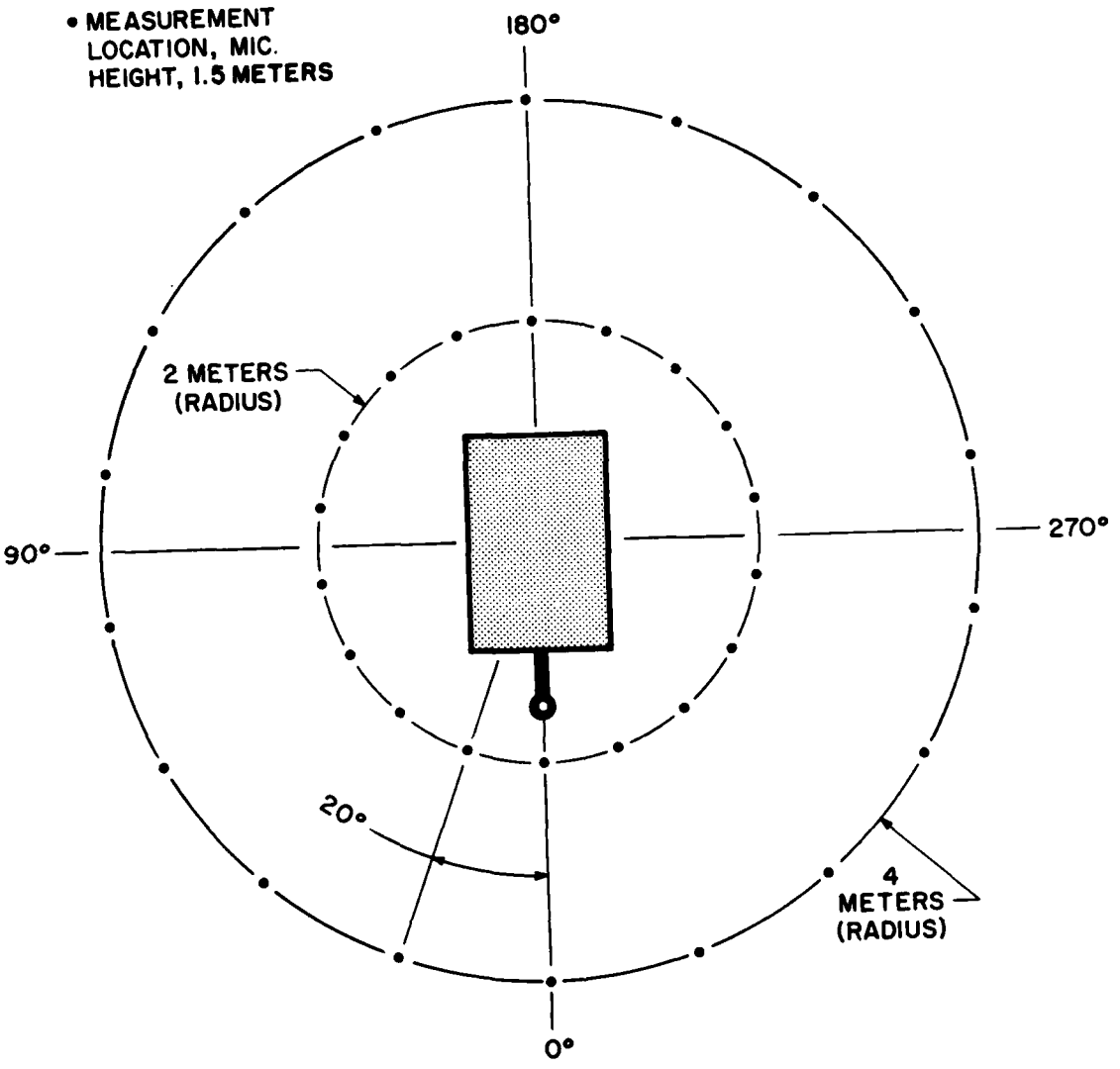

Figure 1. Measurement Locations

TABLE: 2 — MEASURED SOUND PRESSURE LEVEL (DB), 1/3 OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST BA-000-006
RUN 01
25 JAN 82
PAGE F1

NOISE SOURCE/SUBJECT:
MB-3 TESTER, PRESSURIZED
CABIN LEAKAGE, AIRCRAFT
NEAR FIELD NOISE LEVELS

OPERATION:
LOADED (3 PSI)

LOCATION/CONDITION

FREQ (HZ)	DISTANCE (M)->	4	4	4	4	4	4	4	4	4	4	4	4	4
	ANGLE (DEG)-->	0	20	40	60	80	100	120	140	160	180	200	220	240
	CONDITION---->	A	A	A	A	A	A	A	A	A	A	A	A	A
25														
31.5														
40														
50			75<	75<	76<	75<	75<	75<	75<					
63		83<	80<	82<	86	87	87	86	84	81<	80<	81<	80<	76<
80														
100			71<	71<										
125		77<	76<	75<	74<	71<	75<	78<	79<	79<	78<	74<	73<	
160		69<	69<	69<	70<	71<	69<		68<	69<	71<	71<	68<	
200		77	76	74<	73<	76	78	80	79	78	81	83	81	75<
250		89	86	82	79	89	90	92	90	89	92	94	91	74<
315		73	72<	71<	68<	69<	71<	70<	72<	71<	72<	73	72<	71<
400		70	70	71	70	71	71	70	70	71	71	72	70	71
500		69	72	72	72	71	77	71	76	72	74	73	76	75
630		71	74	73	75	73	73	70	73	74	72	72	73	75
800		71	74	72	73	74	72	73	73	73	74	72	72	74
1000		73	72	73	74	71	77	76	77	75	74	74	76	74
1250		72	71	70	73	72	72	73	73	73	74	73	74	75
1600		73	72	71	73	71	71	72	73	73	73	72	73	76
2000		72	71	73	74	71	71	72	72	71	70	73	73	76
2500		73	73	75	75	73	73	75	77	78	78	79	77	77
3150		73	72	74	73	72	72	74	74	73	73	74	76	76
4000		70	70	71	71	70	70	72	72	72	73	73	73	75
5000		71	71	72	72	72	72	73	75	75	73	75	74	74
6300		68	68	69	69	69	69	70	70	71	69	71	70	72
8000		67	68	69	70	69	69	70	70	71	69	70	70	71
10000		63	64	65	66	67	65	66	67	67	66	66	68	68
OVERALL		90	89	88	89	92	93	94	93	91	93	95	92	87

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) 1/3 OCTAVE BAND

NOISE SOURCE/SUBJECT: MB-3 TESTER, PRESSURIZED CABIN LEAKAGE, AIRCRAFT NEAR FIELD NOISE LEVELS

OPERATION: LOADED (3 PSI)

IDENTIFICATION: OMEGA 3.2 TEST 8A-000-006 RUN 02 25 JAN 82 PAGE F2

	LOCATION/CONDITION												
FREQ (HZ)	DISTANCE (M)->	4	4	4	4	4	2	2	2	2	2	2	2
	ANGLE (DEG)--->	260	280	300	320	340	0	20	40	50	80	100	120	140
	CONDITION---->	A	A	A	A	A	A	A	A	A	A	A	A	A
25														
31.5														
40														
50							78<	78<	77<	77<	78<	76<	79<	79<
63		73<	79<	84	86	85	81<	83<	86	87	83	88	88	87
80														
100			72<	73<	73<	74<	72<	73<	73<	72<	71<		72<	75<
125					73<	72<	76<	77<	79<	78<	78<	79<	81<	83
160		69<	70<	69<	69<	69<	73<	73<	72<	72<	72<	70<	70<	72<
200		82	82	76	72<	79	81	79	76	78	77	76	76	78
250		93	94	87	81	90	92	88	85	88	86	86	86	86
315		72<	73	70<	69<	70<	75	76	73	73	74	74	75	77
400		70	71	71	72	70	73	73	74	76	77	78	74	75
500		73	72	72	75	70	79	78	79	85	86	85	79	78
630		70	74	73	73	71	78	78	76	80	76	78	76	78
800		75	73	75	75	74	77	77	76	78	78	76	74	76
1000		76	76	75	79	76	77	81	79	78	78	76	78	79
1250		75	74	74	74	72	76	75	78	77	78	77	77	78
1600		74	73	75	72	71	77	75	77	78	77	76	77	79
2000		75	76	75	74	71	76	76	77	78	78	76	76	77
2500		77	77	78	77	74	76	78	79	77	77	77	78	81
3150		75	77	77	76	75	74	74	79	77	77	77	77	79
4000		74	75	75	74	71	72	72	76	75	75	74	75	77
5000		75	77	77	75	73	73	74	76	77	77	76	77	78
6300		73	74	73	72	70	70	71	73	74	74	73	73	74
8000		72	73	73	71	70	70	71	74	75	74	73	73	74
10300		68	69	68	68	66	66	67	70	70	71	70	70	72
OVERALL		94	95	91	90	92	94	92	92	94	94	93	93	93

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 — MEASURED SOUND PRESSURE LEVEL (DB), 1/3 OCTAVE BAND

NOISE SOURCE/SUBJECT: MB-3 TESTER, PRESSURIZED CABIN LEAKAGE, AIRCRAFT NEAR FIELD NOISE LEVELS

OPERATION: LOADED (3 PSI)

IDENTIFICATION: OMEGA 3.2 / TEST BA-000-006 / RUN 03 / 25 JAN 82 / PAGE F3

	LOCATION/CONDITION										
FREQ (HZ)	DISTANCE (M)-> 2	2	2	2	2	2	2	2	2	2	OPERATOR LOCATION TEST CONDITION
	ANGLE (DEG)--> 160	180	200	220	240	260	280	300	320	340	
	CONDITION----> A	A	A	A	A	A	A	A	A	A	1/A
25											
31.5											81<
40											
50	78<	79<	78<	77<	76<	75<	76<	76<	77<	78<	83<
63	85	84<	82<	82<	82<	81<	79<	79<	79<	79<	89
80											73<
100	71<	72<						72<	73<	72<	78<
125	80<	79<	76<	73<				73<	77<	77<	76<
160	71<	72<	71<	69<	69<	72<	72<	72<	71<	71<	79
200	94	89	89	85	83	86	86	85	79	73	93
250	95	100	101	97	94	97	97	97	87	84	103
315	76	79	79	78	77	77	76	77	76	72<	86
400	75	77	77	77	77	77	76	75	75	74	83
500	80	78	78	81	79	81	79	81	80	78	86
630	76	76	77	75	77	77	77	81	82	79	84
800	77	77	79	78	78	77	77	78	80	76	84
1000	77	78	81	81	80	78	79	80	81	76	86
1250	76	78	78	79	79	80	80	80	79	77	87
1600	78	77	79	78	80	80	81	80	78	76	86
2000	77	76	78	79	78	81	80	80	78	77	88
2500	81	81	81	82	81	81	82	82	81	77	90
3150	79	77	79	79	82	81	82	81	80	76	89
4000	76	76	77	77	78	78	79	79	77	73	86
5000	77	77	79	79	79	80	81	81	79	76	90
6300	73	74	74	75	77	78	78	78	76	73	86
8000	78	75	75	76	77	77	78	78	77	74	86
10000	72	71	72	73	73	73	74	74	73	70	83
OVERALL	96	101	101	98	96	96	98	98	93	92	105

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 — MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

NOISE SOURCE/SUBJECT: MB-3 TESTER, PRESSURIZED CABIN LEAKAGE, AIRCRAFT NEAR FIELD NOISE LEVELS

OPERATION: LOADED (3 PSI)

IDENTIFICATION: OMEGA 3.2 TEST BA-000-006 RUN 01 25 JAN 82 PAGE J1

		LOCATION/CONDITION												
FREQ (HZ)	DISTANCE (M)->	4	4	4	4	4	4	4	4	4	4	4	4	4
	ANGLE (DEG)-->	0	20	40	60	80	100	120	140	150	160	200	220	240
	CONDITION---->	A	A	A	A	A	A	A	A	A	A	A	A	A
31.5														
63			81	83	86	87	87	00	85					
125		77	78	77	76	74	76		79	79	73	76	74	
250		88	86	83	80	89	90	72	90	89	92	95	91	78
500		75	77	77	77	75	79	75	78	77	77	77	78	79
1000		77	77	77	78	77	79	79	80	79	78	78	79	79
2000		77	77	78	79	76	77	76	79	80	74	81	80	81
4000		75	76	77	77	76	76	78	78	78	78	79	79	80
8000		71	72	73	73	73	73	74	74	74	73	74	74	75
OVERALL		89	89	86	89	92	93	93	93	91	93	95	92	87

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST BA-000-006
RUN 02
25 JAN 82
PAGE J2

NOISE SOURCE/SUBJECT:
MB-3 TESTER, PRESSURIZED
CABIN LEAKAGE, AIRCRAFT
NEAR FIELD NOISE LEVELS

OPERATION:
LOADED (3 PSI)

FREQ (HZ)	LOCATION/CONDITION												
	DISTANCE (M) ->	4	4	4	4	4	2	2	2	2	2	2	2
	ANGLE (DEG) --->	260	280	300	320	340	0	20	40	60	80	100	120	140
	CONDITION ---->	A	A	A	A	A	A	A	A	A	A	A	A	A
31.5														
63							83	85	86	87	83	89	88	88
125			74	74	77	77	79	79	80	80	78	79	82	83
250		93	94	86	81	90	92	89	86	89	87	87	86	87
500		76	77	77	78	75	82	80	82	86	87	86	82	82
1000		80	79	79	81	79	81	83	83	82	83	81	81	82
2000		80	80	81	79	77	81	80	83	82	81	81	82	84
4000		80	81	81	80	78	78	78	82	81	81	81	81	83
8000		75	77	77	75	74	74	75	77	76	78	77	77	78
OVERALL		94	95	90	86	91	94	92	92	94	94	93	93	93

TABLE: 2 — MEASURED SOUND PRESSURE LEVEL (DB), OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST 9A-000-006
RUN 03
25 JAN 82
PAGE 33

NOISE SOURCE/SUBJECT:
MB-3 TESTER, PRESSURIZED CABIN LEAKAGE, AIRCRAFT NEAR FIELD NOISE LEVELS

OPERATION:
LOADED (3 PSI)

LOCATION/CONDITION

FREQ (HZ)	DISTANCE (M) ->	2	2	2	2	2	2	2	2	2	2	OPERATOR LOCATION
	ANGLE (DEG) -->	160	180	200	220	240	260	280	300	320	340	TEST CONDITION
	CONDITION---->	A	A	A	A	A	A	A	A	A	A	1/A
31.5												
63		85	85	84	83	83	82	81	81	80	81	90
125		81	81	78	75				77	79	79	82
250		95	101	101	97	94	97	98	97	98	90	104
500		82	82	82	83	83	84	82	84	85	82	89
1000		81	83	84	84	84	83	84	84	85	81	90
2000		83	83	84	84	85	85	86	85	84	81	93
4000		81	81	83	83	83	84	85	85	83	80	93
8000		79	78	78	80	81	81	82	82	80	77	90
OVERALL		95	101	101	98	96	96	99	98	98	92	105

TABLE: 3 MEASURES OF HUMAN NOISE EXPOSURE

IDENTIFICATION:
OMEGA 3.2
TEST BA-000-006
RUN 01
25 JAN 82
PAGE H1

NOISE SOURCE/SUBJECT: MB-3 TESTER, PRESSURIZED CABIN LEAKAGE, AIRCRAFT NEAR FIELD NOISE LEVELS

OPERATION: LOADED (7 PSI)

LOCATION/CONDITION													
DISTANCE (M)-->	4	4	4	4	4	4	4	4	4	4	4	4	4
ANGLE (DEG)-->	0	20	40	60	80	100	120	140	160	180	200	220	240
CONDITION---->	A	A	A	A	A	A	A	A	A	A	A	A	A
HAZARD/PROTECTION													
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR													
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR													
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)													
NO PROTECTION													
OASLC	90	89	88	89	91	92	93	92	91	93	95	92	97
OASLA	85	84	84	84	85	86	87	87	86	87	89	87	86
T	404	480	480	480	404	339	285	285	339	285	202	285	339
MINIMUM SPL EAR MUFFS													
OASLA*	66	65	63	63	67	68	69	68	67	70	71	68	61
T	960	960	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS													
OASLA*	62	61	60	61	64	65	66	64	63	65	67	64	56
T	960	960	960	960	960	960	960	960	960	960	960	960	960
V-51R EAR PLUGS													
OASLA*	61	60	59	58	62	63	64	63	62	65	66	64	59
T	960	960	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS PLUS V-51R EAR PLUGS													
OASLA*	46	45	45	46	47	48	49	49	48	49	50	48	45
T	960	960	960	960	960	960	960	960	960	960	960	960	960
H-133 GROUND COMMUNICATION UNIT													
OASLA*	58	57	56	58	59	60	61	61	60	61	63	61	59
T	960	960	960	960	960	960	960	960	960	960	960	960	960
COMMUNICATION													
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)													
PSIL	76	77	77	78	77	78	77	79	79	78	76	79	80
ANNOYANCE													
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)													
TONE CORRECTION (C IN DB)													
PNLT	102	100	100	102	103	103	104	104	104	105	106	104	103
C	3	2	2	3	3	3	3	3	3	3	3	3	3

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

TABLE: 3 MEASURES OF HUMAN NOISE EXPOSURE

IDENTIFICATION:
OMEGA 3.2
TEST BA-000-006
RUN 02
25 JAN 82
PAGE 42

NOISE SOURCE/SUBJECT: MB-3 TESTER, PRESSURIZED CABIN LEAKAGE, AIRCRAFT NEAR FIELD NOISE LEVELS

OPERATION: LOADED (3 PSI)

LOCATION/CONDITION													
DISTANCE (M)->	4	4	4	4	4	2	2	2	2	2	2	2	2
ANGLE (DEG)-->	260	280	300	320	340	0	20	40	60	80	100	120	140
CONDITION---->	A	A	A	A	A	A	A	A	A	A	A	A	A
HAZARD/PROTECTION													
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR													
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR													
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)													
NO PROTECTION													
OASLC	94	95	91	90	92	94	92	92	91	93	93	92	93
OASLA	86	89	87	86	88	88	86	89	90	89	89	88	90
T	240	202	285	339	339	240	240	202	170	202	202	240	170
MINIMUM SPL EAR MUFFS													
OASLA*	70	71	66	64	68	70	67	67	69	69	68	68	68
T	960	960	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS													
OASLA*	65	67	62	61	64	66	63	63	65	65	65	64	65
T	960	960	960	960	960	960	960	960	960	960	960	960	960
V-51R EAR PLUGS													
OASLA*	65	66	62	60	63	65	64	63	65	65	64	63	64
T	960	960	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS PLUS V-51R EAR PLUGS													
OASLA*	50	50	48	48	43	50	49	49	51	51	50	49	50
T	960	960	960	960	960	960	960	960	960	960	960	960	960
H-133 GROUND COMMUNICATION UNIT													
OASLA*	62	62	61	60	60	62	61	63	62	62	62	62	63
T	960	960	960	960	960	960	960	960	960	960	960	960	960
COMMUNICATION													
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)													
PSIL	79	79	79	79	77	81	81	82	84	84	83	81	83
ANNOYANCE													
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)													
TONE CORRECTION (C IN DB)													
PNLT	105	106	103	102	103	105	103	105	105	106	106	104	106
C	3	3	2	1	3	2	2	2	2	3	3	2	2

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

TABLE: 3 MEASURES OF HUMAN NOISE EXPOSURE

IDENTIFICATION:
OMEGA 3.2
TEST BA-000-006
RUN 03
25 JAN 82
PAGE M3

NOISE SOURCE/SUBJECT: MB-3 TESTER, PRESSURIZED CABIN LEAKAGE, AIRCRAFT NEAR FIELD NOISE LEVELS

OPERATION: LOADED (7 PSI)

	LOCATION/CONDITION										
DISTANCE (M)-->	2	2	2	2	2	2	2	2	2	2	OPERATOR LOCATION
ANGLE (DEG)-->	160	180	200	220	240	260	280	300	320	340	TEST CONDITION
CONDITION---->	A	A	A	A	A	A	A	A	A	A	1/A
HAZARD/PROTECTION											
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR											
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR											
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)											
NO PROTECTION											
OASLC	96	101	101	98	96	99	96	96	93	92	105
OASLA	91	94	94	92	92	93	93	93	91	88	100
T	143	65	85	120	120	101	101	101	143	240	30
MINIMUM OPL EAR MUFFS											
OASLA*	72	77	77	74	72	74	74	74	68	63	81
T	960	960	960	960	960	960	960	960	960	960	807
AMERICAN OPTICAL 1700 EAR MUFFS											
OASLA*	66	73	73	70	68	70	70	70	67	64	77
T	960	960	960	960	960	960	960	960	960	960	960
V-51R EAR PLUGS											
OASLA*	67	72	73	69	68	70	70	69	65	64	76
T	960	960	960	960	960	960	960	960	960	960	960
AMERICAN OPTICAL 1700 EAR MUFFS PLUS V-51R EAR PLUGS											
OASLA*	52	56	56	54	52	54	54	54	51	49	61
T	960	960	960	960	960	960	960	960	960	960	960
H-133 GROUND COMMUNICATION UNIT											
OASLA*	64	67	68	66	65	66	67	66	63	61	73
T	960	960	960	960	960	960	960	960	960	960	960
COMMUNICATION											
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)											
PSIL	82	83	83	84	84	84	84	84	84	81	91
ANNOYANCE											
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)											
TONE CORRECTION (C IN DB)											
PNLT	107	111	112	110	109	110	110	110	106	104	117
C	2	3	3	3	3	3	3	3	2	2	2

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

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